In the Claims

Claims remaining in the application are as follows:

1. (Currently amended): A storage system comprising:

a storage array containing a plurality of storage devices of at least three different and distinct controller-to-storage device bus interface technology types including volatile solid-state and non-volatile disk types in a single array and having a respective class hierarchy; and

a controller coupled to the storage device plurality that executes hierarchical storage management and selectively controls usage of storage according to the different and distinct controller-to-storage device bus interface technology type whereby the controller allocates hierarchically inferior storage ~~is used~~ for temporary storage, unexpected mission-critical storage, and hierarchical storage management (HSM)-type low usage data storage.

2. (Currently amended): The storage device according to Claim 1 wherein:

the storage array contains an hierarchy of storage devices [[of]] connected by at least three different and distinct controller-to-storage device bus interface technology types that have a respective performance hierarchy.

3. (Currently amended): The storage device according to Claim 1 further comprising:

the storage array contains an hierarchy of storage devices [[of]] connected by at least three different and distinct controller-to-storage device bus interface technology types that have a respective economic or cost hierarchy.

4. (Currently amended): The storage device according to Claim 1 further comprising:

a solid state cache and shared memory coupled interior to the controller and supplying storage as a distinct controller-to-storage device bus interface technology type for a level of hierarchical storage.

5. (Currently amended): The storage device according to Claim 1 further comprising:

Small Computer Systems Interface (SCSI) and/or Fibre Channel (FC) storage devices coupled to the controller by SCSI and/or FC buses and supplying storage as a distinct controller-to-storage device bus interface technology type for a level of hierarchical storage.

6. (Currently amended): The storage device according to Claim 1 further comprising:

Serial AT-attached (SATA) storage devices coupled to the controller by a SATA bus and supplying storage as a distinct controller-to-storage device bus interface technology type for a level of hierarchical storage.

7. (Previously presented): The storage device according to Claim 1 further comprising:

a solid state cache and shared memory coupled interior to the controller and supplying storage as a distinct controller-to-storage device bus interface technology type for a first level of hierarchical storage;

relatively higher performance Small Computer Systems Interface (SCSI) and/or Fibre Channel (FC) storage devices coupled to the controller by SCSI and/or FC buses and supplying storage as a distinct controller-to-storage device bus interface technology type for a second level of hierarchical storage;

relatively lower performance Serial AT-attached (SATA) storage devices coupled to the controller by a SATA bus and supplying storage as a distinct controller-to-storage device bus interface technology type for a third level of hierarchical storage; and

a process executable in the controller allocates storage capacity of the SATA storage devices to low access customer data and to short-term and unpredictable storage usage.

8. (Original): The storage device according to Claim 7 further comprising:
an hierarchical storage management controller for usage within a disk array utilizing Fibre Channel (FC) and SATA disk drives and that allocates SATA storage as uncommitted and unstructured storage.

9. (Original): The storage device according to Claim 7 further comprising:
an hierarchical storage management controller for usage within a disk array utilizing Fibre Channel (FC) and SATA disk drives and that allocates SATA storage for intra-array and/or inter-array data transfers including logical unit (LUN) copies and snapshots.

10. (Currently amended): A method of managing information storage in a storage system comprising:
enclosing an hierarchy of storage devices of at least three different and distinct controller-to-storage device bus interface technology types including volatile solid-state and non-volatile disk types in a single array and having a respective class hierarchy within a storage array; [[and]]
selectively controlling information usage of storage according to the different and distinct controller-to-storage device bus interface technology type; and
using ~~whereby~~ hierarchically inferior storage ~~is used~~ for temporary storage, unexpected mission-critical storage, and hierarchical storage management (HSM)-type low usage data storage.

11. (Currently amended): The method according to Claim 10 further comprising:
coupling an hierarchy of storage devices into the storage array including at least three different and distinct controller-to-storage device bus

interface technology types that have a respective performance hierarchy.

12. (Currently amended): The method according to Claim 10 further comprising:

coupling an hierarchy of storage devices into the storage array including at least three different and distinct controller-to-storage device bus interface technology types that have a respective economic or cost hierarchy.

13. (Original): The method according to Claim 10 further comprising:

combining an hierarchy of storage devices into the storage array including at least a volatile shared memory, a relatively higher performance non-volatile storage, and a relatively lower performance non-volatile storage.

14. (Original): The method according to Claim 10 further comprising:

combining an hierarchy of storage devices into the storage array including at least a solid state cache and shared memory supplying storage for a first level of hierarchical storage, relatively higher performance Small Computer Systems Interface (SCSI) and/or Fibre Channel (FC) storage devices supplying storage for a second level of hierarchical storage, and relatively lower performance Serial AT-attached (SATA) storage devices supplying storage for a level of hierarchical storage.

15. (Original): The method according to Claim 14 further comprising:

allocating storage capacity of the SATA storage devices to low access customer data and to short-term and unpredictable storage usage.

16. (Original): The method according to Claim 14 further comprising:

allocating SATA storage as uncommitted and unstructured storage.

17. (Original): The method according to Claim 14 further comprising:
allocating SATA storage for intra-array and/or inter-array data transfers including logical unit (LUN) copies and snapshots.

18. (Currently amended): A storage system comprising:
a disk array containing an hierarchy of disk adapters and coupled storage disks of at least two different and distinct controller-to-storage device bus interface technology types and having a respective class hierarchy; and
a controller coupled to the disk array ~~and capable of executing~~ that executes an hierarchical storage management ~~capability~~ functionality that selectively controls access to the hierarchy of disk adapters and coupled storage disks whereby the controller allocates hierarchically inferior storage ~~is used~~ for temporary storage, unexpected mission-critical storage, and hierarchical storage management (HSM)-type low usage data storage.

19. (Currently amended): The storage system according to Claim 18 further comprising:
a cache memory coupled interior to the controller and operable as an additional storage in the class hierarchy.

20. (Original): The storage system according to Claim 18 further comprising:
an hierarchy of storage devices having a respective performance hierarchy.

21. (Original): The storage system according to Claim 18 further comprising:
an hierarchy of storage devices having a respective economic or cost hierarchy.

22. (Original): The storage system according to Claim 18 further comprising:
a cabinet enclosing the disk array and the controller.

23. (Currently amended): The storage system according to Claim 18 further comprising:

relatively higher performance Small Computer Systems Interface (SCSI) and/or Fibre Channel (FC) disks coupled to the controller by SCSI and/or FC buses and supplying storage for a first level of hierarchical storage;

relatively lower performance Serial AT-attached (SATA) disks coupled to the controller by a SATA bus and supplying storage for a second level of hierarchical storage; and

a process executable in the controller allocates storage capacity of the SATA disks to low access customer data and to short-term and unpredictable storage usage.

24. (Currently amended): An article of manufacture comprising:

a ~~controller-usable~~ tangible computer-readable medium having a ~~computable-readable~~ program code for execution on a controller embodied therein for managing a storage system, the ~~computable-readable~~ program code further comprising:

a code ~~capable of causing~~ that causes the controller to intercommunicate among an hierarchy of storage devices of at least three different and distinct controller-to-storage device bus interface technology types including volatile solid-state and non-volatile disk types in a single array and having a respective class hierarchy within a storage array; and

a code ~~capable of causing~~ that causes the controller to selectively control information access to the hierarchy of storage devices within the storage array; and

a code that causes the controller to use ~~whereby~~ hierarchically inferior storage ~~is used~~ for temporary storage, unexpected mission-critical storage, and hierarchical storage management (HSM)-type low usage data storage.

25. (Currently amended): A storage system comprising:

means for coupling an hierarchy of storage devices of at least three different and distinct controller-to-storage device bus interface technology types including volatile solid-state and non-volatile disk types in a single array and having a respective class hierarchy within a storage array; [[and]]

means for selectively controlling information access to the hierarchy of storage devices within the storage array; and

means for using ~~whereby~~ hierarchically inferior storage ~~is used~~ for temporary storage, unexpected mission-critical storage, and hierarchical storage management (HSM)-type low usage data storage.